

## New taxa in two families previously unrecorded from the Ethiopian Region (Diptera: Odiniidae and Diastatidae)

by

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### SYNOPSIS

The families Odiniidae and Diastatidae are recorded for the first time from the Ethiopian Region, and the following new taxa are described: Odiniidae—*Odinia penrithorum* sp. n., *O. connecta* sp. n.; *Afrodinia* gen. n., type *A. deemingi* sp. n., *A. medleri* sp. n.; *Turanodinia cornesi* sp. n.; *Traginops* (*T.*) *moremii* sp. n., *T. (T.) shewelli* sp. n., *T. (Paratraginops) ruwenzoricus* sp. n.; *Paratraginops* Hendel is reduced in status to a subgenus of *Traginops* Coquillett. Diastatidae—*Diastata montana* sp. n., *D. carolinae* sp. n., *D. stuckenbergi* sp. n.

### INTRODUCTION

Both families considered in this paper have not previously been recorded from the Ethiopian Region. It may be argued that the amount of material at present available, thirteen specimens of Odiniidae and five specimens of Diastatidae, is insufficient to justify the erection of twelve new taxa. However, these specimens represent the cumulative results of years of collecting by many collectors. As representatives of both families are so rarely taken, even with modern trapping and mass-collecting techniques, it is unlikely that a significant number of additional specimens will be available in the foreseeable future. It is hoped that one result of recording these species will be to stimulate interest in the families, and that field workers active in Africa will make a special effort to obtain more material and make observations on the life-histories of the species.

### ACKNOWLEDGEMENTS

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### Family ODINIIDAE

Odiniids are small to medium-sized flies of compact build and, in the Ethiopian Region, with attractive markings. Wing markings range from simple cloudings of the cross-veins in *Odinia* to the most intricate dappled patterns found in species of *Traginops*. Only in exceptional circumstances are the adults observed or collected in any numbers, and the majority of described species are known from only a few specimens.

No doubt as a result of their attractive appearance and unusual life-histories, odiniids have attracted the attention of a number of workers in recent years. Collin (1952) revised the Palaearctic *Odinia* species, and Sabrosky (1959) carried out the

same task on the New World fauna. Shewell (1960) recorded additional species and genera from North America, with keys to World genera, and Hennig (1969) erected two subfamilies and described new species and a genus from South America, also keying the World genera. Additional species have been described by Kato (1952), Steyskal (1959) and Cogan (1969).

### Biology

As is often the case with all but the most common species of Acalpterate Diptera, information on the biology of odiniids is fragmentary and at times apparently contradictory. The larvae usually live in association with wood-boring beetles or moths, although whether they are parasites, predators, saprophages or simply living as commensals is difficult to establish from published data. The following information has been collected from the data given with published descriptions, together with some original and unpublished observations. Nothing is known about the biology of any of the Ethiopian species, and in the following list all the species are of Holarctic distribution.

#### (a) Doubtfully in association:

*Odinia boletina* Zetterstedt, larvae in *Polyporus* on poplar and beech, not in any obvious association.

*Traginops irrorata* Coquillett, pupae in exuding wounds on *Ulmus americana* L.

*Odinia pomona* Cogan, larvae and pupae under bark of apple tree, no record of association.

#### (b) Apparently benign association:

*O. boletina* Zetterstedt, of Kato, 1952, pupae in burrows of Gelechiidae in twigs of walnut, *Juglans regia* L.

*Odinia betulae* Sabrosky, from logs of *Betula papyrifera* Marsh infested by Ambrosia-beetles and *Agrius anxius* Gory (Buprestidae). Also from white and black spruce, balsam, and white birch attacked by various beetles.

*Odinia hendeli* Collin, larvae in rotting elm wood in association with the Oedemerid beetle, *Ischnomera caerulea* L.

*Odinia maculata* Meigen, in association with cossus-infested oak.

*Odinia mejerei* Collin, in primary egg galleries of *Scolytus quadrispinosus* Say in Hicoria, also in Hicoria infested with *Scolytus* and *Saperda*. In the tulip tree, *Liriodendron tulipifera* L., infested with the phycitid *Euzophera ostricolorella* Hulst. Larvae in galleries of *Scolytus scolytus* F. on *Ulmus*.

*Traginops purpurops* Steyskal, in association with *Ecdytolopha insitiana* Zeller, on *Robinia*.

*Neoalticomerus seamansi* Shewell, in association with *Cryptorhynchus lapathi* L. (Curculionidae), in stem of *Populus balsamifera* Muench.

*Odinia xanthocera* Collin, from mines of *Cryptorhynchus lapathi* L. in *Salix*, and mines and galls of *Saperda populnea* L. on *Alnus*, *Salix* and *Populus*.

#### (c) Predators or parasites.

*Odinia conspicua* Sabrosky, parasite of *Scotobates* (Tenebrionidae) under bark of *Populus grandidentata* Michx., larvae reared from dead larvae of *Scotobates calcaratus* F., in decaying wood of *Populus grandidentata* Michx.

*Turanodinia coccidarum* Stackelberg, larva in egg masses of *Pseudococcus comstocki* Kuwana.

Adult flies may be taken attending tree fluxes or on fungi, and there are records of them in fruit-fly traps (Steyskal 1963: 52). It would appear likely that the adults, in their search for oviposition sites, are attracted to the various fungi that develop in damaged hard-wood. The larvae probably develop in these fungi or, possibly, the fungi that grow on the frass produced by the larvae of the original wood-borer. The single record of the larva as a 'parasite' may possibly be explained as a development from a mycophagous to a saprophagous feeding habit.

#### Key to the genera and species of Ethiopian Oдиниidae

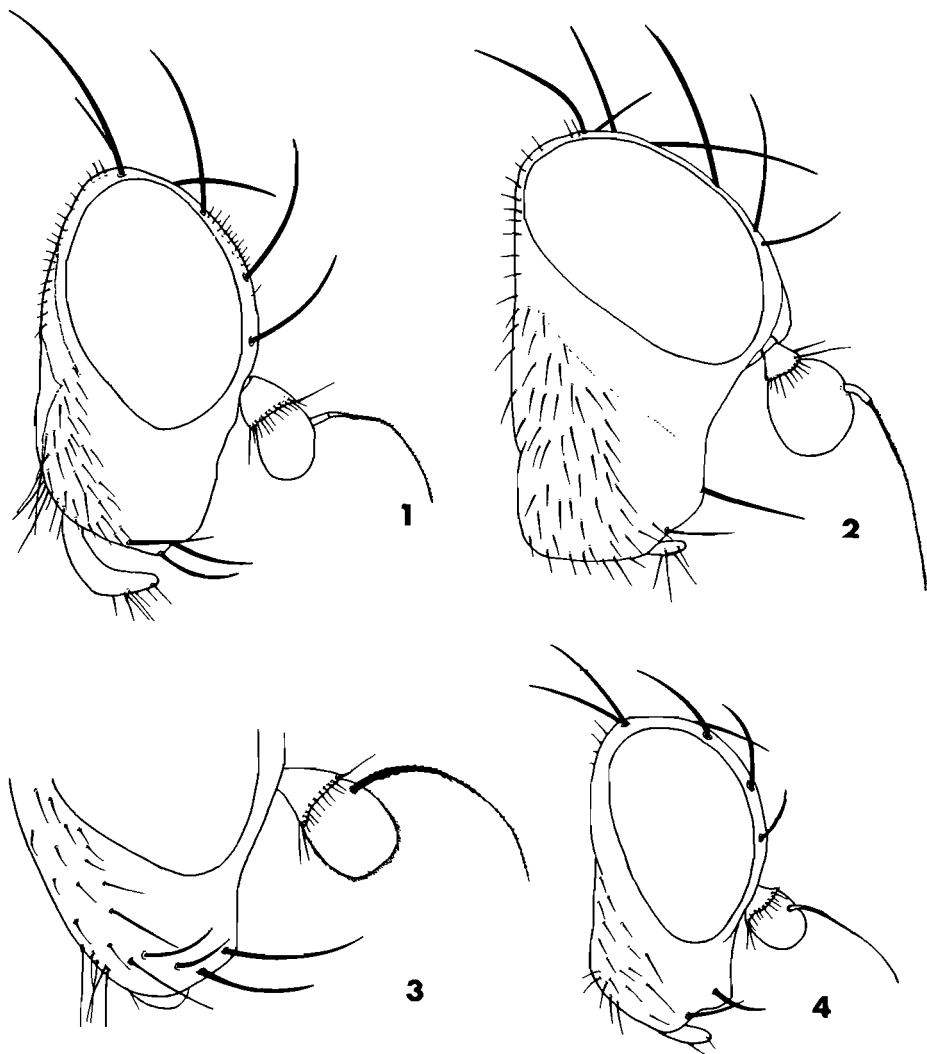
1. Disc of scutellum bare; costa extending only as far as the third longitudinal vein ( $r_{4+5}$ ).....subfamily **Odiniinae**....2
- Disc of scutellum with setulae; costa extending to the fourth longitudinal vein ( $m_1$ ).....subfamily **Traginopinae**....6
2. Dorsal pre-apical bristles well developed on all tibiae; five, (1+4) strong and distinct dorsocentral bristles on mesonotum, prescutellar bristles present; posterior cross-vein developed.....**Odinia**....3
- Dorsal pre-apical bristles absent or poorly developed on tibiae; only four (1+3) distinct dorsocentrals; prescutellar bristles absent or reduced; posterior cross-veins lacking.....4
3. Large species (wing 5,2 mm), with distinctive markings; central frons, antennae and legs dark brown; costal and basal region of submarginal cells with dark brown patches.....**Odinia penrithorum** sp. n.
- Smaller species (wing 3,6 mm) grey, with yellow antennae; wing only darkened on the anterior and posterior cross-veins, and at the point where the first longitudinal vein fuses with the costa.....**Odinia connecta** sp. n.
4. Wing membrane hyaline; mesonotum and scutellum greyish-brown, without dark markings; lunule large, extending half the distance between the antennae and the anterior ocellus.....**Turanodinia cornesi** sp. n.
- Wing membrane with a reticulate pattern; mesonotum strikingly marked with velvety-black on grey; scutellum black, shining or sub-shining; lunule extending less than  $\frac{1}{2}$  the distance between antennae and anterior ocellus.....**Afrodinia** gen. n.....5
5. Lower occipital and buccal bristles all white; wing as in fig. 8; thoracic pattern as in fig. 14b.....**Afrodinia deemingi** sp. n.
- Some lower occipital and buccal bristles black; wing as in fig. 9; thoracic pattern as in fig. 14a.....**Afrodinia medleri** sp. n.
6. Arista long plumose (fig. 7); ocellar prominence reduced (fig. 6).....**Traginops (Paratraginops) ruwenzoricus** sp. n.
- Arista short pubescent; ocellar prominence well developed (fig. 5).....**Traginops** s. str.....7
7. Yellow area of anterior frons extending posteriorly as far as the posterior ocellus; wing as in fig. 12.....**Traginops shewelli** sp. n.
- Yellow area of anterior frons extending posteriorly only as far as the anterior ocellus; wing as in fig. 13.....**Traginops moremii** sp. n.

Genus *Odinia* Robineau-Desvoidy

*Odinia* Robineau-Desvoidy, 1830: 648. Type-species: *Odinia trinotata* Robineau-Desvoidy, by designation of Rondani (1875: 167) = *maculata* (Meigen).

A predominantly Holarctic genus of thirteen described species, to which two Ethiopian species may now be added. Both the Ethiopian species are aberrant in body form and colouring, but in all other respects they fall within the accepted generic limits.

*Odinia* may be characterized as follows. *Head*, lacking a conspicuous ocellar prominence; antennal arista micropubescent; with at most only one strong bristle in addition to the vibrissa. *Thorax*, five pairs of dorsocentral bristles, one humeral,



Figs 1-4. *Odinia penrithorum* sp. n. (1), head, lateral view; *Afrodinia deemingi* sp. n. (2), head, lateral view; *Odinia connecta* sp. n. (3), head, lateral view; *Turanodinia cornesi* sp. n. (4), head, lateral view.

3–4 sternopleurals, one propleural, but no stigmal bristle; mesopleuron and disc of scutellum without hairs or bristles; fore coxae with strong ventrally directed bristles, tibiae with pre-apical bristles and mid tibia with 1–3 strong apical spurs; male hind femora usually incrassate; wing rarely with reticulate pattern, hind cross-vein present.

***Odinia penrithorum* sp. n.**

The largest recorded species in the family, 6.3 mm from antennal base to tip of abdomen. In head shape and body coloration unlike any described species in the genus, although the flattened and receding lower facial region (fig. 1) is foreshadowed by a similar development in *O. connecta* sp. n.

*Head*, antennal segments I and II reddish-brown, segment III dark brown, arista dark and micropubescent; mesofrons and vertex, laterally dark brown, remainder of frons, vertex and lunule silvery-grey; a broad, velvety-black horizontal band from the lower incurved fronto-orbital to the level of the base of the eye; face and bucca silvery-grey. Post-orbital series extending ventrally to vibrissa, three strong bristles along buccal edge, one on the vibrissal ridge in addition to the vibrissa; palpi black with numerous short bristles in the ventral series.

*Thorax*, silvery-grey dusted, with dark brown markings on the notum laterally and posteriorly to suture; brown area fusing posteriorly in midline just before prescutellar bristles; presutural dorsocentrals arising from small brown patches, setulae very small and scattered. Legs dark, blackish-brown lightened on the apices of the tibiae, on the trochanters and the anterior face of the hind femur, and extensively on the posterior face; scutellum and prescutellum grey. Pleura silvery-grey, darkened anteriorly; sternopleural bristles three in number, the mid bristle  $\frac{1}{2}$  length of the anterior. Halteres pale, darkened on the knob. Both wings of the holotype specimen damaged, but the pattern very distinctive; two round brown spots in the subcostal cell, diffuse darkening of a band from sub-costa to anal cell, three black marks in submarginal cell masking two adventitious cross-veins, remainder of membrane hyaline. Wing length 5.2 mm.

*Abdomen*, silvery-grey dusted, with lateral, brown markings on the posterior halves of all segments, and a median pair of elongate markings forming interrupted vittae on segments III–V. Male genital capsule pale reddish-yellow.

Holotype male: SOUTH WEST AFRICA (W3), Otjitambi Farm, 43.5 km ESE Kamanjab, 13–15.2.1972 (coll. Southern African Exp.), B.M. 1972–1. In BM(NH).

I have pleasure in dedicating this species to Mary-Louise and Michael Penrith, who assured the success of the South West African phase of the BM(NH) Southern African Expedition by their organization and hospitality.

***Odinia connecta* sp. n.**

A very distinctive species. *O. xanthocera* Collin is the only other described Old World species with totally yellow antennae, but the shape of the lower facial region and the third antennal segment are quite different in *O. connecta* (fig. 3). *O. penrithorum* is the other African species assigned to this genus, and is very much larger and more strikingly marked on the head, notum and wings.

*Head*, totally grey dusted; antenna pale reddish-yellow, including the micropubescent arista. All bristles well developed including the frontal setulae; lunule divided

vertically by a shallow seam. Post-occipital bristle series extended to the vibrissal angle; one strong and four medium bristles along buccal edge in addition to the vibrissa. Palpus pale yellow.

*Thorax*, completely grey dusted with a pair of brown vittae along the line of the dorsocentrals and a diffuse median line branching posteriorly and fusing with the vittae just before the prescutellar bristles; mesonotal setulae well developed, but confined to the disc of the mesonotum. Pleura uniformly grey; three bristles in the sternopleural fan. Halteres pale yellow; wing membrane hyaline, darkened only around the anterior and posterior cross-veins and where the first longitudinal vein reaches the costa. Legs reddish-yellow, heavily dusted with grey on the femora and darkened towards the apices of the tibiae and on the tarsi; three strong spurs plus 2–3 short spines on the mid tibia.

*Abdomen*, grey dusted with a median pair and a lateral pair of diffuse, brown patches on the posterior halves of segments III–V.

Length from base of antenna to tip of abdomen, 3.6 mm.

Holotype female: N. NIGERIA, Zaria, Samaru, 15.9.1968 (coll. J. C. Deeming) m.v. trap. In BM(NH).

In its head shape and body coloration *O. connecta* is an intermediate form between the characteristic condition to be found in the Palaearctic species and that of the aberrant *O. penrithorum*.

#### Genus *Afrodinia* gen. n.

Closely related to the genus *Odinia*, but I feel that it warrants separate generic status as it differs in a number of significant characters.

*Head*, broad, bucca wide, lower face flattened and receding. Frontal setulae lacking; arista micropubescent; only vibrissa strongly developed at mouth edge, one other short bristle inserted below vibrissa and less than half as strong; many of the occipital and cheek bristles hair-like, and white; no dorsally directed bristles present.

*Thorax*, a single humeral and 1–3 pairs of dorsocentral bristles present, but post-sutural, prescutellar and propleural bristles absent. Mid sternopleural bristles reduced to a hair. Scutellum rounded. Leg bristles reduced, postero-dorsal and postero-ventral series on the fore femora short, none of the bristles longer than the width of the femur; antero-ventral series on the hind femora reduced to one strong bristle; male hind femora greatly enlarged; all pre-apical tibial bristles reduced. Wings lacking the posterior cross-vein, strongly marked in the costal cell, but remaining markings diffuse.

*Abdomen*, bristles irrorate, tergites without a vittate or fasciated pattern.

*Afrodinia* resembles *Turranodinia* Stackelberg, in the absence of the posterior cross-vein and the reduction of the pre-apical tibial bristles, but in all other aspects of form and colouring, and probably also in life history, it differs to a major degree. In facial shape and colour of head and thorax, *Afrodinia* species resemble *Odinia penrithorum*. In view of the known 'host' associations of many Holarctic species of *Odinia*, breeding in the tunnels of wood-boring beetles, it is tempting to speculate that the similarities in head form and colouring mentioned above are the result of similar adaptations to a similar host beetle. One other aspect of the pattern of *Afrodinia* species is worthy of note; the arrangement of black patches around the edges of the mesonotum and scutellum is also characteristic of many Ceratitine Tephritidae, and occurs in isolated

instances in other families. Whether this pattern has developed as part of a mimetic association is impossible to say at present.

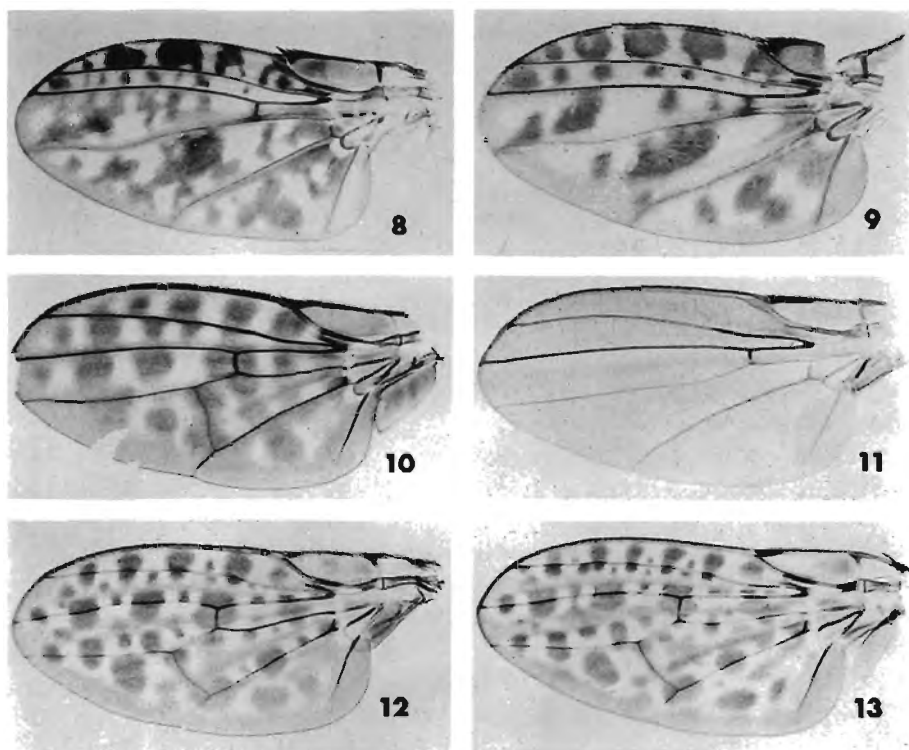
Type-species: *Afrodinia deemingi* sp. n.

***Afrodinia deemingi* sp. n.**

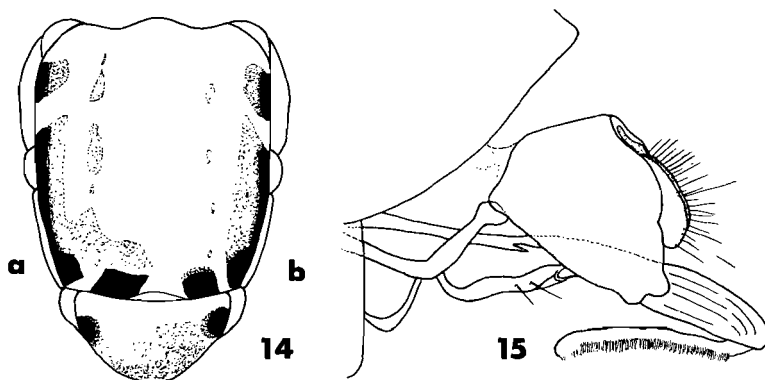
Very closely related to *A. medleri* sp. n. and the characters used to separate the two species, in the absence of genitalic characters, may be found to be variable when more material becomes available. In addition to differences in the wing patterns, *A. deemingi* lacks dark bristles in the buccal and genal series, has more numerous mesonotal setulae, and a less extensively darkened mesonotum.

**Head**, antennal segments I, II, the apical portion of III and the arista dark, segment III reddish-yellow, darkened over the apical  $\frac{2}{3}$  externally, and  $\frac{1}{3}$  on the internal face. Frons and vertex grey dusted, frons shining black anteriorly, and all frontal and vertical bristles arising from small brown patches; dorsal  $\frac{1}{3}$  of face black, remainder of face and bucca white; vibrissa and one small additional ventral bristle black, all cheek bristles white. Palpus pale yellow.

**Thorax**, densely grey dusted, with a contrasting black pattern (fig. 14); the black lateral area consists of three broad velvety-black patches with a pair of prescutellar



Figs 8–13. *Afrodinia deemingi* sp. n. (8), left wing; *A. medleri* sp. n. (9) left wing; *Traginops ruwenzoricus* sp. n. (10) left wing; *Turanodinia cornesi* sp. n. (11) left wing; *Traginops shewelli* sp. n. (12) left wing; *T. moremii* sp. n. (13) left wing.



Figs 14–15. (14) Diagrammatic representation of thoracic patterns of a, *Afrodinia medleri* sp. n., right side; b, *A. deemingi* sp. n. (15), male post-abdomen, lateral view.

velvet patches; scutellum shining black. Notopleural suture and area between the posterior lateral and the prescutellar black patches golden dusted. Pleura uniformly grey; middle bristle of the sternopleural fan less than  $\frac{1}{3}$  as long as the outer bristles. Wing as in fig. 8, length 3.1 mm. Legs testaceous yellow, darkened on the tibiae in three narrow bands, and the metatarsi narrowly banded apically, remaining tarsi extensively darkened; hind femur lightly grey dusted.

*Abdomen*, ♂, grey dusted, all setulae irrorate, segment III brown, due to the fusion of the irrorations; genital capsule testaceous yellow with pale grey dusting. Male genitalia as in fig. 15. ♀, more extensively brown laterally on segments II–IV to produce a fasciated pattern.

Holotype male: N. NIGERIA, Zaria, Samaru, 10.8.1969 (coll. J. C. Deeming) m.v. trap. In BM(NH).

Paratype female: N. NIGERIA, Kogin Kano Game Reserve, 10.2.1974 (coll. H. Politzar).

#### *Afrodinia medleri* sp. n.

Similar to *A. deemingi*, but may be distinguished by the presence of black cheek bristles, a more extensive dark element in the mesonotal pattern, and reduction in the reticulate wing pattern (fig. 9). Only points of difference are included in the following description.

*Head*, antennal segments I and II dark brown, segment III testaceous yellow uniformly clothed in short white pubescence; arista pale basally. Frons shining brown anteriorly. Cheek bristles as extension of post-occipital series black, remaining cheek bristles white. Palpus grey.

*Thorax*, mesonotal pattern as in fig. 14, scutellum only shining around the apical bristles, remainder dusted; Wing as in fig. 9, length 2.5 mm. Legs testaceous yellow, lightly silvery-grey dusted on the fore and hind femora.

*Abdomen*, segments I and II brown, III–V brown laterally on the posterior half of the segments due to the fusion of the irrorations.

Holotype female: NIGERIA, W. State, Idanre, 2.5.1970 (coll. J. T. Medler). In BM(NH).



*Afrodinia* sp.

I have seen two female specimens, one from South Africa and the other from South West Africa, Okahandja, both of which may represent new species or simply geographical forms of either of the two described species. The South West African specimen resembles *A. deemingi* in thoracic and wing pattern, but has lighter antennal coloration, segments I and II being reddish-brown. In possessing dark cheek bristles it resembles *A. medleri*. The grey coloration of the palpus is quite unlike either described species.

The South African specimen is slightly teneral, and differs from the South West African specimen by possessing a more extensively darkened and less strongly vittate abdomen with only segment III grey dusted to any degree, and an indistinct grey vitta passing medially from III-V; segments IV-V grey laterally extending only  $\frac{1}{3}$  width and depth of the segment on the dorsal surface; abdominal bristles shorter than on the South West African specimen. Comparison of the abdominal structures of the two specimens failed to show any outstanding differentiating characters.

Genus *Turanodinia* Stackelberg

*Turanodinia* Stackelberg, 1944: 127. Type-species: *Turanodinia coccidarum* Stackelberg, by original designation.

The genus *Turanodinia* was erected for an aberrant species reared from the egg masses of the coccid *Pseudococcus comstocki* Kuw. It is very closely related to *Odinia* from which it may be distinguished as follows.

*Head*, lunule very large, extending to half-way between the anterior ocellus and the antennae. Antennal segments small, segment III tending to a globular condition, segment II lacking a strong dorsal bristle, arista bare. Anterior frons lacking obvious setulae.

*Thorax* with only four distinct dorsocentrals, although there are a number of small setulae in the line of the dorsocentrals; prescutellum absent; sternopleural series of only two strong bristles, the median bristle reduced. Dorsal pre-apical bristles reduced on all tibiae. Wing with the posterior cross-vein lacking. In general form *Turanodinia* species are small flies of sombre coloration, their most distinctive character being the lack of a posterior cross-vein, a character which they share with *Afrodinia*.

*Turanodinia cornesi* sp. n.

May be distinguished from the type-species of the genus by the brown body coloration and the lack of any pigmented area over the position of the posterior cross-vein.

*Head*, pale buff brown, lightened only on the cheeks; antennal segments I and II reddish-brown, segment III reddish-yellow, rounded. Arista relatively short (fig. 4); frons pale around the lunule, darker on the vertex; face greyish-brown; palpus pale yellow.

*Thorax*, greyish-brown dusted; greyer laterally on the mesonotum and ventrally on the pleura; anterior dorsocentrals poorly differentiated from setulae; acrostichals in three irregular rows, lateral setulae in a band from the humeral to the supra-alar region. Scutellum concolorous with the mesonotum; two pairs of scutellar bristles and a basal pair of very short and weak bristles inserted to the main basal pair. Small prescutellar bristles almost indistinguishable from the setulae. Legs reddish-yellow,

fore coxae silvery-grey dusted and all femora with some darker dusting. Leg bristles reduced, only one strong bristle in the postero-ventral series on the fore femur and one on the antero-ventral series on the hind femur. Two short ventral spurs on the apex of the mid tibia. Halteres pale yellow. Wings as in fig. 11, length 2,6 mm.

*Abdomen*, tergites dark brown with narrow pale areas on the posterior edges of segments II–IV, more extensively pale on segment V.

Holotype female: WESTERN NIGERIA, Lagos, Ikoyi, 21.2.1974 (coll. M. A. Cornes). In BM(NH).

I have seen a further specimen of what I believe to be this species, from Cameroon, 25 km N Bertoua, 1.3.1972 (coll. J. Cruwell), in U.S.N.M., taken at black-light. The specimen is paler than the holotype and appears to have been dry-mounted from spirit. The frons, cheeks and base of the arista, and scutellum, are all pale yellow. The tiny additional scutellar bristles are lacking and the mesonotal setulae are reduced in number, but this may be due to mechanical damage sustained in preparation.

#### Genus *Traginops* Coquillett

*Traginops* Coquillett, 1900: 429. Type-species: *T. irroratus* Coquillett, by original designation.

A very distinctive genus with a characteristic head shape (fig. 5). The projecting ocellar prominence is a character it shares with *Paratraginops*, although in the latter the prominence is lower and the anterior edge does not project beyond the plane of the anterior frons. The characters used by Hendel to differentiate *Paratraginops* from *Traginops* were apparently gleaned from Cresson's description of *T. pilicornis* (see Shewell 1960: 625). Shewell reduced the distinguishing characters to two, namely, the long-plumose arista and the narrowed apex of the first-posterior cell. The species *Traginops ruwenzoricus* sp. n., described here, and *T. clathrata* Hendel, both have plumose aristae, short plumose in *clathrata*, but in *ruwenzoricus* equally as long as found in *Paratraginops*. The thoracic pattern of dark brown patches and vittae instead of numerous small irrorations is another character shared by both species and *Paratraginops*. The ocellar prominence in both *ruwenzoricus* and *clathratus* is less well pronounced than in other *Traginops* species. There would, therefore, appear to be a continuous grading between the two genera, suggesting that they are not separable. However, there are three characters found in typical *Paratraginops* species which throw some doubt on this synonymy, although I believe them to be foreshadowed to some degree in *ruwenzoricus*. The most significant is the presence of only one humeral bristle; all *Traginops* species possess three. *T. ruwenzoricus*, however, has the ventral one of the three reduced to a hair. The ocellar prominence, apart from its poor development, has a covering of short, hair-like bristles extending to the posterior vertex in an irregular band. At the vertex the post-vertical bristles are almost indistinguishable from the surrounding bristles and there has been the development of an additional pair of lateral 'post-verticals'. In *ruwenzoricus* and *clathratus* the ocellar setulae extend posteriorly in an irregular band, but there has been no development of an additional pair of post-verticals. Finally, *Paratraginops* species bear a bristle below the propleural stigma, and this is present in *ruwenzoricus* and *clathratus*, but in no other *Traginops* species. I have decided, for the present and in the absence of any important apomorphic characters in common, to maintain *Traginops* and *Paratraginops* as distinct taxa, but reduce the latter to a subgenus.

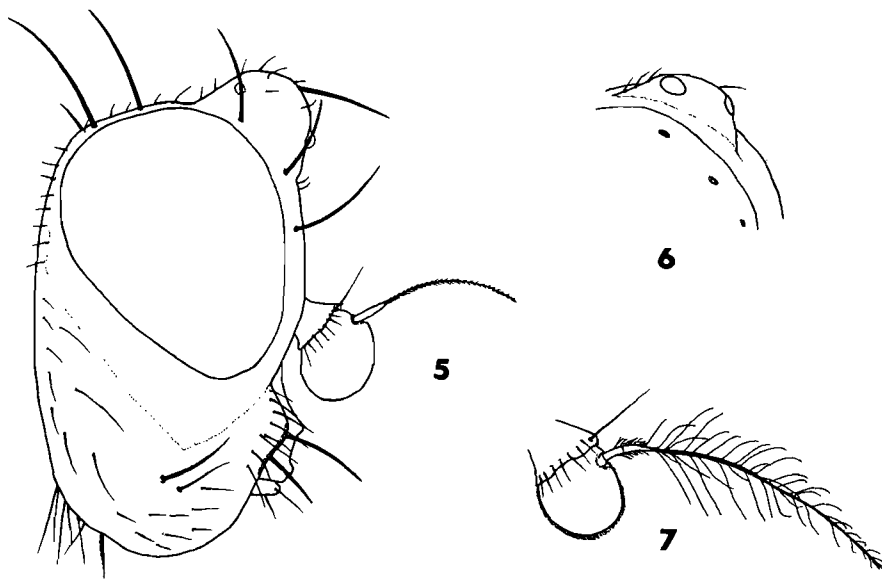
Subgenus *Traginops* s. s.

This subgenus may be distinguished from *Paratraginops* by the following combination of characters: *head* with the ocellar prominence strongly developed and projecting anteriorly beyond the plane of the face, antennal arista pubescent or very short haired, vibrissal ridge bearing only 2-3 strong bristles in addition to the vibrissa; *thorax* with three humeral bristles present, wing pattern a reticulum of small brown spots on a clear or white membrane; thoracic pattern composed of numerous irrorations around the bases of all the bristles and setulae.

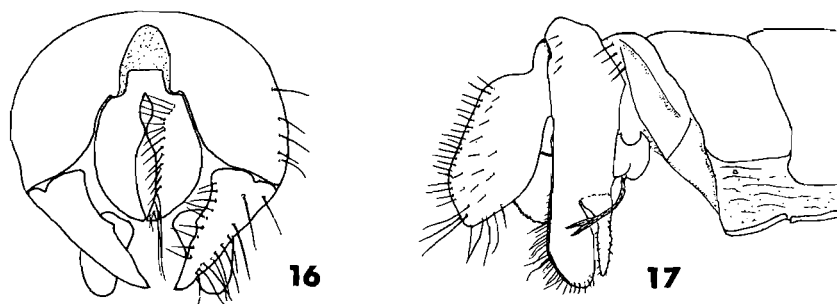
*Traginops moremii* sp. n.

Closely related to the East African species, *T. shewelli*, but differing in the extent of the yellow coloration on the anterior frons, small details of the thoracic pattern, the extent of the lateral grey areas on the abdominal tergites and, most markedly, in the size of the anal cerci and other post-abdominal characters (fig. 17)

*Head*, antenna pale reddish-yellow, segment I totally grey dusted, darkened extensively on segment III; arista dark, micropubescent. Frons dark brown, medially with two rows of small bristles, brown area extending on to ocellar prominence as far as the anterior ocellus, anterior frons dark reddish-yellow, orbital strips silvery-grey and extending on to the vertex and post-occipital region; all frontal, vertical and occipital bristles arise from dark brown areas; small silvery-grey areas behind the posterior ocelli and in front of the anterior ocellus. Lunule dark grey, but paler on the dorsal margin and around the antennal foveae; face dark grey dusted ventrally, paler on the face below the antennae. Vibrissal ridge darkened, bearing 1-2 strong bristles in addition to the vibrissa, plus a number of weak and shorter bristles; one row of long bristles extending from the post-occipital series and 10-12 strong bristles



Figs 5-7. *Traginops moremii* sp. n. (5), head, lateral view; *T. ruwenzoricus* sp. n. (6-7), ocellar prominence, antero-lateral view (6); left antenna (7).



Figs 16-17. *Traginops moremii* sp. n. (16-17), male post-abdomen, posterior view (16); male post-abdomen, lateral view (17).

on the post-buccal angle; bucca yellowish-grey with three dorsally projecting cheek bristles, all bristles arising from brown patches. Palpus reddish-yellow with a ventral row of short bristles.

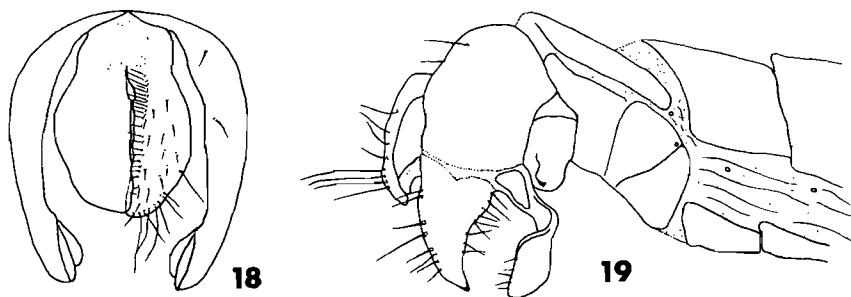
*Thorax*, notum yellowish-grey dorsally, grey on pleura, strongly marked with dark brown as follows: at the base of all the bristles, particularly the four pairs of dorso-centrals (1+3), prescutellar, dorsal, mid and ventral humerals, pre- and post-sutural, anterior and posterior notopleural, scapular, supra-alar, pre-alar and inner and outer post-alar bristles. Mesonotal setulae scattered, but concentrated on the midline and laterally of the line of the dorsocentrals. Scutellum grey, two pairs of bristles, the basal pair arising from the disc, with two brown patches bearing setulae. Pleura with propleural bristles, four strong and two weak sternopleural bristles and a few scattered setulae on the sternopleuron; mesopleuron and pteropleuron bare; two irregular bands along pleura, the dorsal from the posterior edge of the humeral prominence to the base of the wing, and the ventral along the ventral edge of the meso- and pteropleura and the dorsal edge of the sternopleuron. Halteres pale yellow, wing as in fig. 13, length 3.8 mm. Legs: fore femur dark, lightly dusted with dark grey, postero-dorsal series of five bristles, longest equal in length to the width of the femur; postero-ventral series of four bristles, the longest shorter than the width of the femur; mid and hind femora grey dusted with a black diagonal band  $\frac{1}{3}$  from the apex; all tibiae yellow with diffuse black bands basally, and with two further bands each  $\frac{1}{4}$  length of the tibiae; a pair of short apical spurs on the mid tibia; tarsi dark, but each segment narrowly yellow at base and apex to give a banded effect.

*Abdomen*, segments I and II extensively grey, the latter brown posteriorly and, in part, laterally; segments III and IV dark brown, interrupted anteriorly by a grey vitta, and grey laterally; segment V broadly grey medially and laterally, VI and genital segments predominantly grey. Anal cerci large, grey, and with a conspicuous tuft of hair. Genitalia as in figs 16, 17.

Holotype male: BOTSWANA (B.11) Moremi Reserve. 19°23'S, 23°33'E, 18-20.4.1972 (coll. Southern African Exp.), B.M. 1972-1. In BM(NH). The type-specimen was swept from densely shaded undergrowth in a small thicket.

#### *Traginops shewelli* sp. n.

Closely related to *T. moremii*, which it resembles in body colouring and pattern. Only differentiating characters are mentioned in the following description.



Figs 18-19. *Traginops shewelli* sp. n. (18, 19), male post-abdomen, posterior view (18); male post-abdomen, lateral view (19).

*Head*, antenna reddish-yellow, only slightly darkened on the base of segment III; pale yellow coloration of the anterior frons extending posteriorly as far as the posterior ocellus; face and lunule pale grey, bucca pale yellow, with a single dark spot below the eye.

*Thorax*, individual brown markings smaller than in *T. moremii*, but overall area covered by the irrorations is greater. Mesopleuron more extensively marked, grey area reduced to less than  $\frac{1}{3}$  of total. Scutellar brown markings confined to the bases of the scutellar bristles and to two small patches on either side of the midline of the disc; narrow extension of the brown area on the thorax on to the base of the scutellum. Fore femur dark grey dusted; postero-dorsal bristle series well developed, longest bristles longer than the width of the femur; mid and hind femora extensively yellow, banded apically and basally with brown. Wings as in fig. 12, length 3.3 mm.

*Abdomen*, segments I-V with dorsal areas of tergites dark brown and with very narrow grey areas laterally; segment VI pale reddish-brown, genital segments darker; and cerci less than  $\frac{1}{2}$  hypandrial height, see figs 18, 19.

Holotype male: UGANDA. Mulago, Kampala, 4.9.1936 (coll. E. T. Gibbins), B.M. 1937-489. 'On exuded eucalyptus resin.' In BM(NH). Abdomen detached, but mounted with holotype, one wing missing.

Paratype: UGANDA, Mulago, Kampala, 3.9.1936. One male. In BM(NH). Head detached, but mounted with paratype specimen.

#### Subgenus *Paratraginops* Hendel **status n.**

Distinguished from *Traginops* s. s. by the presence of short- or long-plumose arista; reduced ocellar prominence, the anterior edge of which never extends beyond the plane of the face, often not reaching the anterior frons, usually only one humeral bristle, although in *T. ruwenzoricus*, which is tentatively placed here, there are three humeral bristles, the most ventral being reduced to a hair. Both the thoracic and wing patterns are composed of large dark brown patches or vittae, although in *T. ruwenzoricus* the wing pattern is somewhat intermediate in form.

#### *Traginops ruwenzoricus* sp. n.

Apparently more closely allied to *T. clathratus* Hendel, a Neotropical species, than to either of the two species here described from the Ethiopian Region.

*Head*, ocellar prominence poorly developed (fig. 6), dark brown medially, grey

dusted laterally; vertex dark brown to the anterior edge of the ocellar prominence, anterior frons yellow with the orbital bristles arising from brown patches, remainder of the orbital strip grey dusted, the latter extending onto the occiput and post-occipital region; face grey dusted with diffuse darker spots between antennae, on lunule, and on the mid-face; gena yellow, bucca and sub-orbital plate silvery-grey dusted; vibrissal ridge edged in dark brown, 2-3 strong bristles in addition to the vibrissa; two dorsally directed genal bristles; palpus yellow. Antennal segments I, II, arista and dorsal half of segment III darkened, ventral portion of III reddish-yellow, arista long plumose (fig. 7).

*Thorax*, bristling as in *T. moremii*, except as follows: scapular and post-sutural bristles lacking; both dorsal and ventral humeral bristles reduced, particularly the latter, prostigmatal bristle present. Mesonotal pattern with a median broad vitta broadening posteriorly, elongate but irregular brown patches at the base of the dorso-centrals, loosely linked to form an irregular pair of vittae along the line of the dorso-centrals; scattered lateral patches give a predominantly dark brown appearance to the mesonotum. Scutellum grey dusted, pale yellow apically and with an 'L'-shaped brown mark from the basal bristle to the narrow dark brown basal edge of the scutellum; only 3-4 setulae per brown patch on the disc; scutellum brown laterally. Promeso- and pteropleura grey, dorsally with a pair of longitudinal brown vittae, fused anteriorly and posteriorly; sternopleuron predominantly brown. Fore legs dark brown with a narrow apical yellow band on the mid femora and indistinct pale banding on the tibiae and tarsi; mid and hind femora yellow with a partial dark band on the mid, and a complete band on the hind femora; tibiae and tarsi indistinctly banded, brownish yellow and dark brown. Wings as in fig. 10, length 4.3 mm. Halteres pale yellow.

*Abdomen*, dark brown dorsally, edges of tergites grey laterally, segment V lighter brown.

Holotype female: UGANDA, Ruwenzori Range, Kilembe, 1 372 m 12.1934 to 1.1935 (coll. F. W. Edwards). B.M. Afr. Exp., B.M. 1935-203. In BM(NH).

### Family DIASTATIDAE

The family Diastatidae has in the past been based upon two genera, *Diastata* Meigen and *Campichoeta* Macquart, with the recent inclusion of *Euthychaeta* Loew. Recently, Griffiths (1972: 109) erected a new family for *Campichoeta* and placed *Diastata* in the family Ephydriidae. Whilst I am in complete agreement with the view that *Diastata*, alone, is the 'sister-group' of the Ephydriidae, its inclusion within the family is unfortunate. If *Diastata* is placed in the Ephydriidae an exception must be made in its favour to every established character that is used to identify that family, with the exception of a few characters on the abdomen. From a purely practical point of view there is little to be gained that cannot be more satisfactorily achieved by the erection of a supra-familial taxon to include both families.

The only previous record of a *Diastata* from Africa is that of Macquart (1843: 417), who described a species, *Diastata fuscipennis*, from Guinea. This species has now been transferred to the family Curtonotidae.

### Biology

Virtually nothing is known of the early stages of *Diastata* species. In Europe the adults frequent dense, shaded vegetation in woods and in marshy areas. The holotype of *D. carolinae* sp. n. was taken by sweeping shaded vegetation along the sides of a narrow stream that had recently ceased to flow.

### Genus *Diastata* Meigen

*Diastata* Meigen, 1830: 94. Type-species: *Geomyza obscurella* Fallén, by designation of Westwood (1840: 152), misidentification = *Diastata vagans* Loew.

The genus *Diastata* was for many years a 'dumping ground' for a whole variety of species that have now been removed to their appropriate genera. Much early confusion was engendered by the misidentification of the type-species, and *Diastata*, *Geomyza* and *Trixoscelis* were often treated as though they were synonymous.

The genus may be characterized as follows.

**Head** (fig. 20), antenna with long apical bristle on segment II, arista plumose, segments I and II porrect and exerted. Vibrissa present, often with ventral subsidiary bristles. Anterior reclinate and posterior proclinate fronto-orbital bristles, the former inserted medially of the latter. Eye large, bucca narrow, usually  $\frac{1}{6}$  height of eye; head broader than deep.

**Thorax**, two pairs of dorsocentrals, a single pair of humerals, anterior and posterior notopleurals, presutural, and pre- and post-alars; acrostichals uniformly scattered, no obvious prescutellar bristles. Scutellars in two pairs, the basal pair longer than the apicals. Mesopleural bristles in a short series along the posterior edge of the sclerite, some small bristles on the disc; two strong sternopleural bristles, the anterior weaker than the posterior. Wing as in fig. 21, additional ventral costal spines at least twice as long as the width of the costa; anal vein lacking although anal cell at least partly closed. Legs with strong postero-dorsal and postero-ventral series on the fore femur; dorsal pre-apical bristles well developed on all tibiae.

**Abdomen**, male, see figs 24–29; tergites six and seven reduced, represented only by lightly sclerotized areas in the membrane; epandrium large and bulbous, anal cerci reduced and fused ventrally; hypandrium strongly sclerotized. Female with spermathecae reduced, ventral receptacle strongly sclerotized. (Griffiths 1972: 112.)

### Key to the Ethiopian species of the genus *Diastata*

1. Wing membrane predominantly black with small white patches in two transverse bands (fig. 22).....***Diastata carolinae* sp. n.**
- Wing membrane hyaline with infumated areas.....2
2. Head with silvery-white orbital strips; mesonotum bearing a broad brown, median vitta; wing darkened only around the sub-costal region and posterior cross-veins (fig. 21).....***Diastata montana* sp. n.**
- Head lacking distinct orbital strips; mesonotum uniformly greyish-brown dusted; wing strongly infumated along costal edge (fig. 23).....

***Diastata stuckenbergi* sp. n.**

### ***Diastata montana* sp. n.**

One of two species with a predominantly hyaline wing, but unlike *D. stuckenbergi* this species has only the wing-base darkened, in the sub-costal region, and around

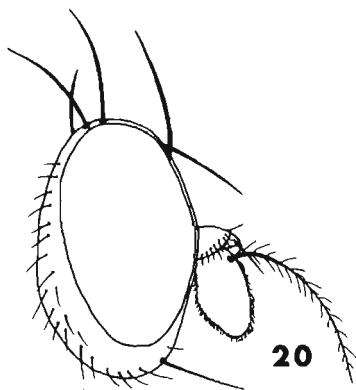


Fig. 20. *Diastata carolinae* sp. n., head, lateral view.

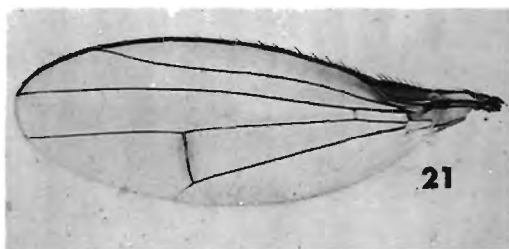


Fig. 21. *Diastata montana* sp. n., left wing.



Fig. 22. *Diastata carolinae* sp. n., left wing.

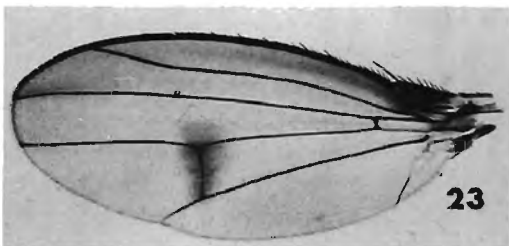


Fig. 23. *Diastata stuckenbergi* sp. n., left wing.

the posterior cross-vein (fig. 21). Also distinguished by the presence in this species of silvery-white orbital and dark grey fronto-orbital strips, reduced post-vertical bristles, and a broad, brown, median band on the mesonotum.

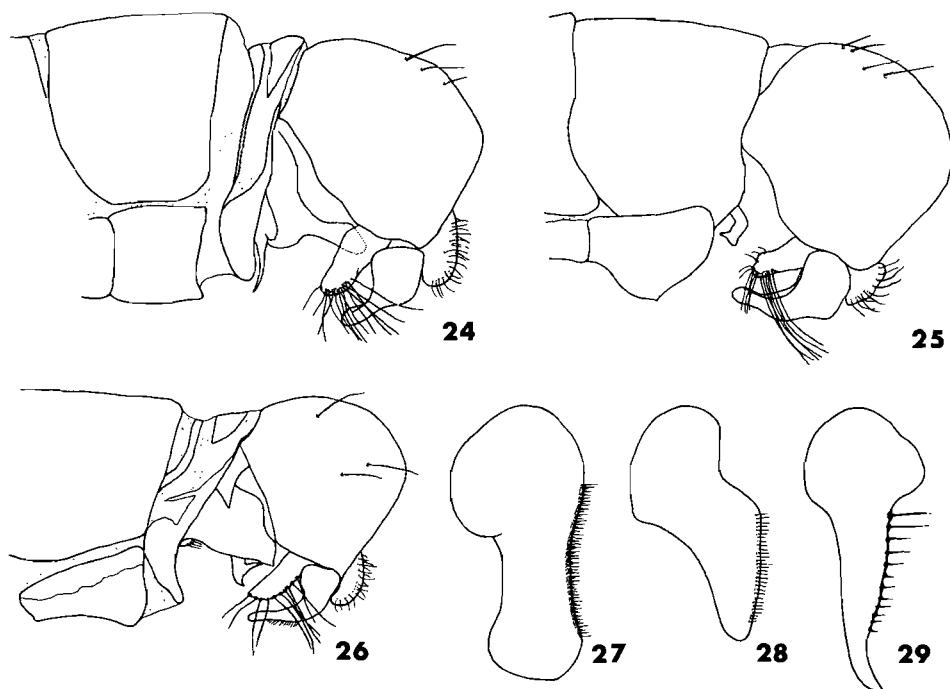
*Head*, antenna reddish-yellow, extensively darkened, apically and dorsally on segment III; arista black. Frons an intense orange colour, darker laterally, and contrasting with the silvery-white orbital and dark grey dusted frontal strips; face and bucca silvery-white; palpus pale reddish-yellow. Post-vertical bristles  $\frac{1}{2}$  as long and strong as the ocellar bristles; no minute bristle between the reclinate fronto-orbital and the inner vertical bristle.

*Thorax*, mesothorax dark reddish-brown strongly grey dusted on the pleura, particularly the sternopleura, and laterally on the notum, the median third of the latter dusted with light brown. Mesopleural bristles small hardly stronger than the mesonotal setulae. Scutellum heavily dusted with grey. Legs yellow, darkened slightly on the hind femora and the apical tarsal segments; postero-dorsal and postero-ventral bristle series on the fore femora reduced, only the most apical bristle of the ventral series longer than the femur is wide. Halteres dark reddish-yellow on the knob, lighter basally on the stem. Wing as in fig. 21, length 3,1 mm.

*Abdomen*, dark reddish-brown, very lightly dusted with grey, and with a uniform scattering of short hairs, slightly longer on segment V and VI; genitalia as in fig. 26.

Holotype male: CAMEROON, Mt Cameroon, Onyanga, 2 469 m, 24.1.1932 (coll. M. Steele), B.M. 1934-240. By sweeping. 82. In BM(NH).





Figs 24–29. *Diastata carolinae* sp. n. (24), post-abdomen, lateral view; *D. stuckenbergi* sp. n. (25), post-abdomen, lateral view; *D. montana* sp. n. (26), post-abdomen, lateral view; *D. stuckenbergi* (27), external clasper; *D. carolinae* (28), external clasper; *D. montana* (29), external clasper.

#### *Diastata carolinae* sp. n.

The most distinctive of the three African species, appreciably darker than the other two both in thoracic and wing coloration. The heavily infumated wing, in which the pattern is derived from a few, small, white patches, suggests a distant relationship with the *nebulosa* group of Palaearctic species.

*Head*, antenna pale yellow slightly darkened on the dorsal edge of segment III; arista black. Frons reddish-yellow, occipital region, frontal strip and ocellar area silvery-grey dusted. Face yellowish-white, bucca and palpus pale yellow.

*Thorax*, mesonotum sub-shining, grey dusted with greenish undertones on the anterior edge, progressively darker and more brown posteriorly; setulae short and uniformly scattered. Pleura dark reddish-yellow lightly dusted with grey, darker posteriorly. Legs, including coxae, pale yellow; only apical tarsal segments and the anterior face of the hind femur slightly darkened. Scutellum sub-shining, dark brown. Wing as in fig. 22, length 3.2 mm. Halteres reddish-yellow basally, white apically.

*Abdomen*, shining, dark reddish-brown, very lightly dusted with grey; uniformly scattered hairs on all segments, in addition a few longer bristles on tergites V and VI. Male genitalia as in figs 24 and 28.

Holotype male: SOUTH AFRICA (5), Cape Town, Kloof Nek, 1–2.1.1972 (coll. Southern African Exp.), B.M. 1972–1. In BM(NH). The specimen was swept from low vegetation in a dried river bed.

***Diastata stuckenbergi* sp. n.**

Easily distinguished from *D. montana* by the absence of silvery-white orbital strips, and of a median, broad, brown thoracic vitta. Greater infumation of the costal wing cells and a broadly darkened posterior cross-vein (fig. 23) will also distinguish this species.

*Head*, ♂, antenna pale reddish-yellow, a little darker on segment III; arista dark brown. Frons pale yellow, from some angles a very narrow silvery-white edging to the frons, adjoining the orbits, is visible; frontal strips poorly differentiated, but bearing a short bristle between the proclinate frontal and the inner vertical bristle. Face silvery-white; bucca and palpus pale yellow. Post-verticals nearly as strong as ocellar bristles.

*Thorax*, dark reddish-brown, strongly grey dusted on the pleura and laterally on the mesonotum; disc of latter uniformly greyish-brown. Scutellum darker than notum, and sub-shining. Legs pale yellow, but with 'knees' on all legs darkened; well-developed basal scopa of short, black bristles on both fore and hind metatarsi. Halteres pale reddish-yellow. Wing as in fig. 23, length 2,8 mm.

*Abdomen*, similar in colour and form to *D. montana*. Male genitalia as in fig. 27.

♀, very similar to the male, but with less development of the basal scopa on the fore and hind legs.

Holotype male: SOUTH AFRICA, Cape Province, Ceres, April 1925 (coll. R. E. Turner), B.M. 1925-210. In BM(NH).

Paratypes: same data as holotype, one male in the Natal Museum, one female in BM(NH).

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